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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/608,272

06/27/2003

Jeffrey E. Fink

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12/13/2006

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EXAMINER

SELLMAN, CACHET I

ART UNIT

PAPER NUMBER

1762

DATE MAILED: 12/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/608,272

Applicant(s)

FINK ET AL.

Examiner

Cachet I. Sellman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-16 and 18-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-11,13-16 and 18-29 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Acknowledgement is made of the amendment filed by the applicant on 9/29/2006, in which claims 1,2,10, 15,1,21-23 were amended. Claims 1-2, 4-16, 18-29 are currently pending in U.S. Application Serial No. 10/608,272.

Response to Arguments

1. Applicant's arguments with respect to claims 1-2, 4-16 and 18-29 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

2. Claim 12 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 12, which depends from claim 1 states that the electromagnetic radiation is one of electron beam, an ultraviolet light source, or a radioactive material. However, claim 1 states that the electromagnetic source is one of electron beam, an ultraviolet light, or radioactive material therefore claim 12 fails to further limit claim 1.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 15-16, 18-24 and 27-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Hanna et al. (US 65745223 B1).

Hanna et al. teaches a process for changing a property of a layer-formed plastic part by forming a first layer (layer 10 of Fig. 2) of a layer formed plastic part (assuming that layers 1-9 are the base of upon which the layer formed plastic part is formed); forming a second layer adjacent the first layer (layer 11 of Fig. 2); determine an exposure of radiation from an electromagnetic source operable to change a property of the second layer to an altered states without changing a first-layer property of the first layer; and exposing the second layer to the radiation without changing the first-layer property of the first layer (col. 6, lines 36 –40) as required by **claim 15**. Hanna et al. teaches recognizing the existing state of the second layer property; identifying a desired state and identifying the exposure of radiation to change the property for the layer to the desired state (col. 6, lines 36-40) as required by **claim 16**. Hanna et al. further teaches exposing a plurality of layers to exposures of radiation and varying the exposure to differently change the properties of respective layers as required by **claims 18 and 19**. Hanna et al. discloses varying the electromagnetic radiation source to change the properties of the layers (Table II and col. 7, lines 23-65; col. 10, lines 4-56) as required

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by **claim 20**. The exposure of electromagnetic radiation is controlled by relative movement of the layer and the electromagnetic source (col. 4, lines 1-5 and 18-22) as required by **claim 21**. Hanna et al. teaches that the layer is moved in an up and down direction by the elevator (col. 4, lines 55-59) as required by **claim 22**. The exposure of radiation is controlled by moving the UV light spot across the surface using mirrors (col. 4, lines 1-5 and 18-22) as required by **claims 23 and 24**. The radiation is controlled by manipulating the magnetic field through which the radiation will pass by using the magnetic mirror which allows for a scanning effect as required by **claim 25**. Hanna et al. teaches that the property to be changed can be elongation (col. 7, lines 23-65; col. 10, lines 2-56) as required by **claim 27**. Curing of the polymer using the UV light results in cross linking of the plastic material as required by **claim 28**. The electromagnetic radiation source is an ultraviolet light source as required by **claim 29**.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1,2, 4-8, and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanna et al. (US 6574523 B1) in view of Ederer (US 6193922 B1).

Hanna et al. teaches a process for changing a property of a layer-formed plastic part by providing a first layer of a partially completed layer-formed plastic part. In Figure 2, one can assume that layers 1-9 is the partially completed layer formed plastic part, the first layer formed is layer 10 of Fig. 2. Hanna et al. teaches positioning the partially completed layer-formed plastic part within a potential exposure range of the electromagnetic radiation source (UV light); forming a second layer adjacent the first layer (layer 11 of Fig. 2); determining an exposure of radiation from the electromagnetic radiation source operable to change a property of the second layer without changing a property of the first layer; and exposing the second layer to radiation to change the second layer property to the altered state (col.6 lines 36-40).

Hanna et al. does not teach that the plastic part is formed using at least one of selective laser sintering and fused deposition modeling as required by **claim 1**.

Ederer discloses a method for forming a three dimensional body from a computer data model by computer controlled layer-wise deposition material. Ederer discloses that stereolithography is limited because of its high expenses for equipment, process, and consumables and because additional equipment for cleaning of the models from liquid resin. Ederer discloses that selective laser sintering avoids the disadvantages of using stereolithography because the plastic powder serves as a supporting means and

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blowing off the unmelted powder after completing the model is sufficient in order to get the finished product (column 1, lines 24-65).

It would have been obvious to one having ordinary skill in the art to modify the process of Hanna et al. to include the post-curing the object made by using selective laser sintering of Ederer. One would have been motivated to do so because both teach processes using three dimensional plastic parts that are formed using a layer by layer process and Ederer further teaches using selective laser sintering over stereolithography because it is less expensive therefore one would have a reasonable expectation of success in modifying the plastic part.

As stated above Hanna disclose that the exposure is determined by recognizing the existing state of the property of the layer; identifying a desired state of the property; identifying the exposure of radiation to change the property of the layer such that the altered state reaches the desired state as required by **claims 2**.

Hanna et al. teaches that the exposure is controlled by relative movement of the layer formed plastic part and the electromagnetic radiation source (col. 4, lines 1-5 and 18-22) as required by **claim 4**. The plastic part is moved relative to the electromagnetic radiation (col. 4, lines 1-5 and 18-22) as required by **claim 5**. The exposure of radiation is controlled by moving the UV light spot across the surface using mirrors (col. 4, lines 1-5 and 18-22) as required by **claims 6 and 7**. The radiation is controlled by

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manipulating the magnetic field through which the radiation will pass by using the magnetic mirror which allows for a scanning effect as required by **claim 8**. Hanna et al. teaches that the property that can be changed is elongation (col. 7, lines 23-65; col. 10, lines 2-56) as required by **claim 10**. Curing of the polymer using the UV light results in cross linking of the plastic material as required by **claim 11**.

Hanna et al. discloses that a part can be produced that has a high temperature property only where required while the remainder of the part is built using a standard method by varying the exposure which assures a firm easy to handle part (column 7, lines 22-28 and Figure 2). In another example, Hanna et al shows by changing the way the laser exposure is applied to the material can increase the durability of the part (Table II); one layer of the part is built using a power of 800 mW and a spot size of 0.030 inches resulting in a tensile elongation of 4% and impact strength of 27 J/m; then a layer is formed using a laser power of 100 mW as a laser spot size of 0.010 inches resulting in a tensile elongation of 10% and impact strength of 37 j/m (column 7, lines 23-65; column 10 lines 4-56; Figures 2 and 4) as required by **claims 13, 14**.

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hanna et al. in view of Ederer as applied to claim 1 above, and further in view of Kukarni et al. (US 6159411).

The teachings of Hanna et al. in view of Ederer as applied to claim 1 are as stated above.

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Hanna et al. in view of Ederer does not teach selectively positioning a radiation blocking shield between the plastic part and the radiation source as required by **claim 9**.

Kulkarni et al. teaches a process of making three dimensional objects using rapid prototyping. Kulkarni et al. teaches that the object can be formed by using a mask to direct the radiation to certain portions of the curable material, or by using mirrors. Kulkarni et al states that the method is dependent on the size and geometry of the object to be formed.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of Hanna et al. in view of Ederer to include the use of a mask as taught by Kulkarni et al. One would have been motivated to do so because both disclose process for making three dimensional objects using rapid prototyping. Hanna et al. teaches that mirrors as well as other optical or mechanical means can be used to control the ultraviolet light on the curable material and Kulkarni et al. teaches operable ways of solidifying the material which depends of the size and desired geometry therefore one would have a reasonable expectation of success in forming the layer formed plastic part with desired features using the mask.

8. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hanna et al. as applied to claim 15 above, and further in view of Kulkarni et al.

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The teachings of Hanna et al. as applied to claim 15 are as stated above.

Hanna et al. does not teach selectively positioning a radiation blocking shield between the plastic part and the radiation source as required by **claim 26**.

Kulkarni et al. teaches a process of making three dimensional objects using rapid prototyping. Kulkarni et al. teaches that the object can be formed by using a mask to direct the radiation to certain portions of the curable material, or by using mirrors. Kulkarni et al states that the method is dependent on the size and geometry of the object to be formed.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of Hanna et al. in view of Ederer to include the use of a mask as taught by Kulkarni et al. One would have been motivated to do so because both disclose processes for making three dimensional objects using rapid prototyping. Hanna et al. teaches that mirrors as well as other optical or mechanical means can be used to control the ultraviolet light on the curable material and Kulkarni et al. teaches operable ways of solidifying the material which depends of the size and desired geometry therefore one would have a reasonable expectation of success in forming the layer formed plastic part with desired features using the mask.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cachet I. Sellman whose telephone number is 571-272-0691. The examiner can normally be reached on Monday through Friday, 7:00 - 4:30pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Cachet I Sellman
Examiner
Art Unit 1762

cis


TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER